

THE ARNOLD ARBORETUM DURING THE FISCAL YEAR ENDED JUNE 30, 1947

DURING THE PAST YEAR many changes have occurred at the Arnold Arboretum. Dr. Merrill retired as Director on reaching the age of 70, but remains as Arnold Professor of Botany. Mr. E. J. Palmer retired at the age of 73, but will remain another year for a special part-time project. Dr. Leon Croizat and Mr. Vladimir Asmous resigned during the year. Dr. Charlotte G. Nast, Curator of the Wood Collections, left to accept a teaching position. None of the resulting vacancies has been filled. We have, however, appointed Mr. Richard Fillmore to succeed the late Mr. Judd as Propagator. Mrs. Beatrix Farrand continues to serve as Consulting Landscape Gardener.

Horticultural Activities.— During the past year nearly 4,000 man days have been spent on the grounds. The major project has been the removal of duplicate and overcrowded plants—a total of more than a thousand. Some of the extra shrubs were moved to nursery rows at the Case estate in Weston. The larger trees were cut up for fire-wood which we hope will pay for some of the costs.

Some new plantings have been made around the Administration Building where we plan to feature the introductions and new hybrids introduced by the Arnold Arboretum. A planting of ground-covers along the road will be extended along the meadow as funds permit.

The opening of vistas and opening up of overcrowded areas, as well as the new plantings has been done in accord with the suggestions of our consulting landscape gardener, Mrs. Beatrix Farrand.

During the current year 155 species and varieties of plants were propagated. We received 267 species or varieties from other institutions and distributed 283.

Photographs in natural color are made for records and for display. There is a need also for black and white prints for use in publications. We have few good pictures for such purposes.

The National Shade Tree Conference, attended by over 500 delegates, held its field demonstration in the Arnold Arboretum last summer.

The Case Estate in Weston has proved to be a valuable adjunct to the Arboretum. Miss Louisa Case died in the fall of 1946 and left additional land and buildings to the Arboretum, together with farm equipment and a substantial endowment. Approximately 46 acres of land were sold to the town of Weston for school purposes, but 145 acres remain in the Case Estates. Most of this land is suitable for experimental work.

Semi-permanent plantings of *Ribes* and *Berberis* have been started at the Case Estate together with other species which should not be given

valuable display space at the Arnold Arboretum proper. Various experimental work has been started on cultural practices and fertilizers. Some of the Bussey Institution and Cabot Foundation work is being done at Weston. The Department of Landscape Architecture of Harvard University has been given the use of an area for demonstration work.

Both at the Arnold Arboretum and at the Case Estates in Weston we are using more mechanized equipment. Power mowers, cultivators, and saws permit more work with fewer men. Weed-killing sprays, flame throwers, and a mulch of spent hops are used to control weeds with a minimum of hand labor.

The plant breeding program is beginning to pay dividends in new varieties of ornamental plants. Last spring two new forsythias, Arnold Giant and Arnold Dwarf were distributed to cooperating nurserymen. Arnold Giant is a tetraploid form of *Forsythia intermedia* produced by colchicine treatment. Arnold Dwarf is a delicate dwarf forsythia produced by species hybridization. Next spring we shall distribute a new dwarf flowering cherry of exceptional merit.

Cytogenetic studies of *Sorbus-Aronia* hybrids have aided in determining the relationships of these genera. Grafting experiments in the Pomoideae and in *Prunus* have proved to be of theoretical interest and of possible economic value. The common lilacs budded on tree lilacs continue to make good growth. This should result in our being able to grow the common lilac free of root suckers.

Comparative Morphology.—Professor Bailey has continued his investigations of the comparative morphology of various dicotyledonous families, with special emphasis upon salient trends of structural specialization in carpels. Dr. B. G. L. Swamy, a Government of India Fellow, is making a comprehensive study of the Saxifragaceae and related families, Mr. James E. Canright of the Magnoliaceae, and Mr. R. W. Vander Wyk of the Annonaceae. Mr. William Spackman, Jr., is continuing his investigations of dicotyledonous woods, with special reference to problems of identifying Mesozoic and Tertiary fossils. The work in comparative morphology has been seriously handicapped during the year by the loss of Dr. Charlotte G. Nast, Curator of the Wood Collections, who has accepted a position at the Nebraska State Teachers College at a much higher salary.

Taxonomy.—Dr. Merrill has continued his taxonomic and bibliographic work and completed his *Index Rafinesquianus*. His extensive Botanical Bibliography of the islands of the Pacific was published by the Smithsonian Institution early in 1947. During the year he was honored by election to foreign membership in the Royal Society of Edinburgh, the Royal Swedish Academy of Sciences, and was appointed as honorary collaborator of the Botanical Garden, Buitenzorg, Java. He also received the George Robert White medal of honor from the Massachusetts Horticultural Society in appreciation of his services to horticulture.

During the past year Professor Rehder completed his bibliography of cultivated trees and shrubs, and part of this work is now in proof. The catalogue begun by Professor Rehder, containing all available references in the periodical literature useful in the classification and identification of woody plants, now contains 144,551 cards — an increase of 3,526 during the past year.

Professor Johnston has worked on the flora of Panama, and has completed a study of the plants of San José Island. Professor Raup's "Botany of the southwestern Mackenzie" has been published in *Sargentia*. Dr. Smith completed a study of *Illicium*, *Schisandra* and *Kadsura* before he left, in late February, for a year of field work in Fiji. Dr. Kobuski has been busy with editorial and curatorial duties, but is continuing his work on the Theaceae. Mr. Palmer is working on *Crataegus* and *Quercus*. Dr. Perry is studying the Papuan collections made during the Richard Archbold Expeditions, while Dr. Allen is continuing work on South American Lauraceae. Dr. Frans Verdoorn is working on his Index Botanicorum, to which more than 120,000 references were added during the year.

The herbarium now contains 626,999 specimens. A total of 35,898 specimens were received by exchange, purchase or for identification. The Arboretum sent 13,046 specimens to other institutions.

The Library. — At the end of the fiscal year the library contained 46,520 bound volumes, 200 unbound volumes, and about 14,000 pamphlets. Through the Interlibrary loan system we loaned 137 volumes in addition to 435 volumes to other Harvard libraries. We borrowed 188 volumes from other libraries, including those of Harvard.

Several exhibits of our rare books were on display for the Visiting Committee, various Garden Clubs and the Massachusetts Horticultural Society visitors. With the end of the war the flow of visitors and students has increased greatly.

Among outstanding gifts were a Gazetteer of Chinese Place Names from the Army Map Service, and six volumes of Backer's Flora of Java, a gift from Dr. Verdoorn.

Financial Report. — Endowment funds received last year included \$55,464.91 from the Marion Roby Case estate, \$10,350.00 from the J. B. Case Fund, by sale of property to the town of Weston, \$150,000.00 from the Katherine T. Balch bequest and contributions to the Judd Memorial Fund, amounting to \$2,862.50 — a total of \$218,577.41 for the fiscal year. In addition funds for current use totaled \$4,970.25, including \$2,320.00 for cultural purposes, a grant of \$500.00 from the Bache Fund of the National Academy for Dr. Merrill's work, and a grant of \$600.00 from the same fund to Dr. A. C. Smith. Harrison W. Smith contributed \$1,500.00 for Chinese exploration work, and the publication fund was increased by \$50.25.

The total income for the year was \$152,409.43, while expenses amounted to \$170,914.89, leaving an apparent deficit of \$18,505.46. The deficit was covered by drawing on a credit balance built up during the war years, and by drawing on contributions for cultural purposes which had also accumulated during the war years.

The endowment of the Arnold Arboretum has increased more than three-fold since Sargent's administration, yet the labor and scientific personnel has not been increased materially. Costs of labor, equipment, and materials have increased almost as rapidly as has the income from endowment. The income from endowment is adequate for routine maintenance, and present projects, but new major projects must be financed by annual or special gifts.

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